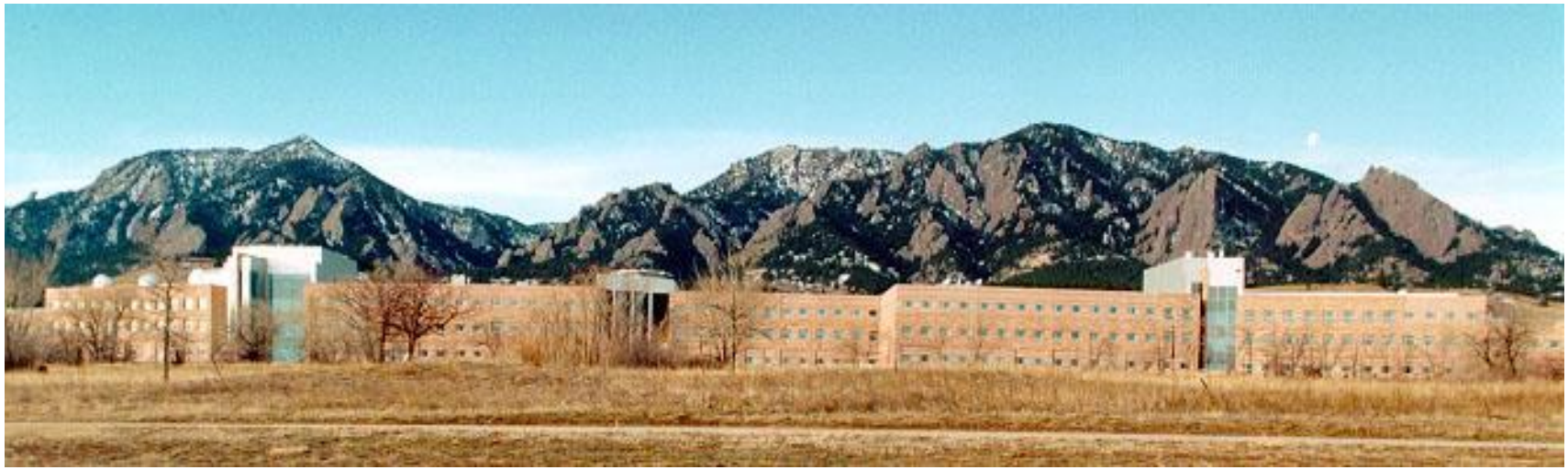


Program Management Review

17 July 2006

3QFY06

Dr. William F. Denig, Chief

Solar (and) Terrestrial Physics Division

NOAA/NESDIS

303 497-6323

William.Denig@noaa.gov

OUTLINE
STP Program Management Review

- **STP Overview/Status (9)**
- **Earth Geophysics Group (10)**
- **Space Environment Group (18)**
- **Earth Observation Group (7)**
- **Concluding Remarks (1)**

WHO WE ARE
STP Overview

Solar-terrestrial Physics Division
William Denig/F Chief
Janet Brown/F, Secretary

Space Environment Group (SEG)

Eric Kihn/F, Team Lead
- Terry Bullett, AFRL
- Craig Clark/F
- Helen Coffey/F
- Ray Conkright/C
- Ed Erwin/F
- Justin Mabie/C
- Rob Redmon/F
- Herb Sauer/C
- Dan Wilkinson/F
- **Kristen Mihalka/S**

Earth Observation Group (EOG)

Chris Elvidge/F, Team Lead
- Kim Baugh/C
- Pat Hayes/C
- Ara Howard/C
- Ben Tuttle/C
- Vacant/C
- Vacant – Data Manager/F

Earth Geophysics Group (EGG)

Sue McLean/F, Team Lead
- Patrick Alken/C
- Ron Buhmann/F
- Paula Dunbar/F
- Karen Horan/F
- Joy Ikelman/F
- Stefan Maus/C
- Rob Prentice/C
- Jesse Varner/C
- Chris Hammond/S
- Andrew Kimbrel/S
- Kelly Stroker/C
- **Don Herzog/C**
- **Tatiana Sazonova/C**
- **Vinita "Ruth" Brocko/C**
- **Chris Wilkinson/S**

Key
F – Federal
C – CIRES/CIRA
S – Student

Personnel Changes
STP Overview

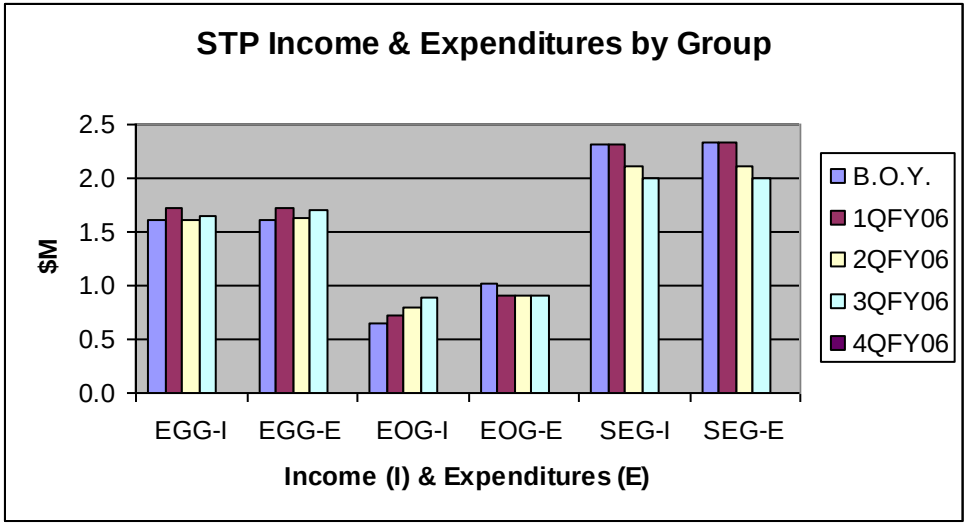
- **Gains**
  - **Don Herzog – EGG/C (Geomag)**
  - **Ruth Brocko – EGG/C (Hazards)**
  - **Tatiana Sazonova – EGG (Hazards)**
  - **Kristin Mihalka – SEG/S – Hollings Scholar (Ionosphere)**
  - **Chris Wilkinson – EGG/S (Solar)**
- **Losses**
  - **None**
- **Vacancies**
  - **EOG data manager (Federal) – initiating paperwork**
  - **EGG Geodesist (CIRES PRA) – offer declined**
- **Inbound**
  - **EOG – Christof Aubrecht – University of Vienna**
  - **EGG – Student (High School)**
- **Pending**
  - **Ron Buhmann/F (EGG) – Probable retirement in 2QFY07**

FY06 Milestones
STP Overview

	PPBES Program	STP FY06 Milestones	Status	Planned Completion Date	Actual Completion Date	Responsible Person
	Space Weather	Complete the rescue of the PCI data including, archive preservation, integration in the SPIDR and quality analysis.	C	(Q1) 12/31/2005	(Q1) 12/15/2005	Kihn
AOP →	Space Weather	Construct a 15-year gridded database of results from linked assimilation models	C	(Q2) 3/31/2006	(Q2) 3/20/2006	Kihn
	Space Weather	Complete the rescue of the RSTN data including, archive preservation, integration in SPIDR and quality analysis	C	(Q2) 3/31/2006	(Q2) 1/9/2006	Coffey
	Space Weather	Publish a Looking Forward to GOES-R web announcement for current users of GOES and POES SEM data	C	(Q2) 3/31/2006	(Q2) 1/17/2006	Wilkinson
	Space Weather	Add 50 Gigabytes of high resolution daily solar H-alpha images to NGDC archives	C	(Q3) 6/30/2006	(Q3) 5/20/2006	Coffey
	Space Weather	Automate the collection, analysis, archive, and dissemination of the USAF ionospheric sounding stations	G	(Q4) 9/30/2006		Redmon
AOP →	Space Weather	Publish Space Weather Analysis (SWA) derived products such as indices via the web	G	(Q4) 9/30/2006		Kihn
	Space Weather	Complete migration of space weather data to the ADIC TLS: GOES SEM, POES SEM, and GOES SXI	C	(Q2) 3/31/2006	(Q2) 3/28/2006	Wilkinson
AOP →	Space Weather	Integrate the NASA CDAWeb data resources with the Space Physics Interactive Data Resource (SPIDR) system.	G	(Q1) 12/31/2007		Kihn
	Marine Transportation Systems	Improve resolution of crustal magnetic field model from degree 90 to 720 to improve ENC navigation models.	G	(Q4) 9/30/2006		McLean
AOP →	Tsunami	Establish archive of tsunami program DART and BPR historical data (3 GB)	C	(Q2) 3/31/2006	(Q2) 3/28/2006	Stroker
	Tsunami	Review and document 60% of deadly past tsunami events	C	(Q2) 3/31/2006	(Q2) 3/28/2006	Dunbar
	Marine Transportation Systems	Increase volume of CORS GPS data ingested annually and placed into the archive by 2 TB.	C	(Q2) 3/31/2006	(Q2) 3/28/2006	McLean
	Marine Transportation Systems	Increase the volume of the DMSP tape library archive by 4 TB	G	(Q4) 9/30/2006		Erwin
	Marine Transportation Systems	Delivery of 3 TB of DMSP data on line.	G	(Q4) 9/30/2006		Elvidge
	Marine Transportation Systems	Generation of first global DMSP OLS imagery constructed area grid at 1 km resolution	G	(Q4) 9/30/2006		Elvidge
	Marine Transportation Systems	Implementation of new near-real time satellite data processing and delivery system for DMSP OLS	G	(Q1) 12/31/2007		Elvidge

Financial
STP Overview

Team	Income	Expenses	Net	Status
SEG	1,998K	1,998K	0K	G
EOG	896K	900K	-4K	G
EGG	1,656K	1,698K	-42K	G

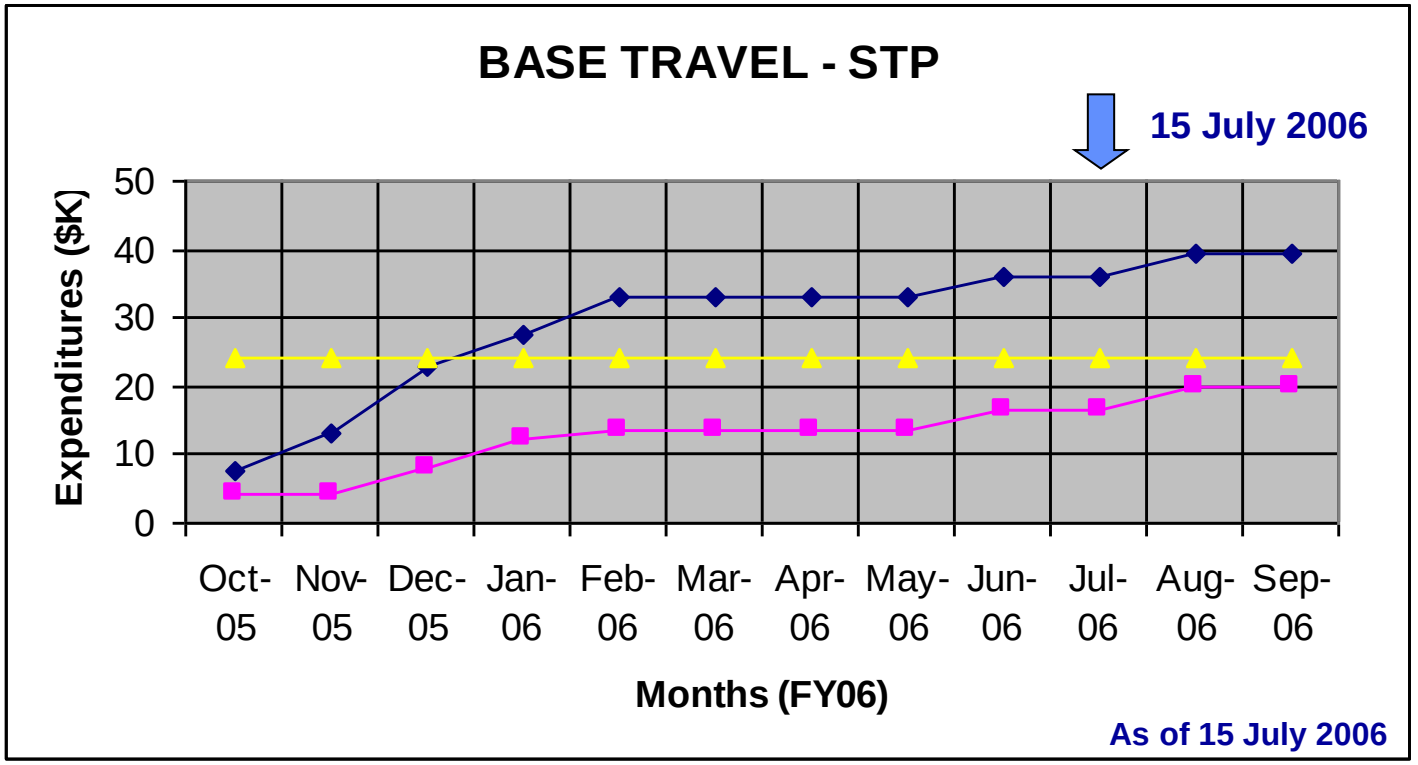


G **Income is within 5% of Expenditures**

Y **Income is within 10% of Expenditures**

R **Income is not within 10% of Expenditures**

Travel
STP Base Travel



CDMP FY06 Proposals
STP Overview

Subject	New - FY06	Continuing	POC	Contractor ($K)	NGDC ($K)	Comments
Heat capacity mapping mission	X		Elvidge	40.0	4.0	On-going
DMSP film scanning		X	Elvidge	800.0	75.0	On-going
Historical solar spectral data	X		Coffey	60.0	6.0	On-going
Historical solar observations		X	Coffey	85.0	8.5	On-going
Historical ionosonde records		X	Kihn	75.0	7.5	Restructured
Rescue of historical tsunami data	X		Dunbar	30.0	3.0	On-going

MOUs / MOAs
STP Overview

STATUS

NGDC	Team	Type		NOAA Legal	DOC Legal	NGDC Signed	Partner Signed	Year	Duration	Status	
DMSP Archive	SEG	MOA	DMSP	X	X	X		2	5	G	Awating DMSP signature - info only
AFCCC	SEG	MOU	AFWA	X	X	X	X	3	10	G	In place - nothing to report - info only
Ionosonde	SEG	MOU	AFWA	X	X			-	5	G	Awaiting AFRL signature - info only
NASIC	EOG	MOU	NASIC	X	X	X	X	1	5	G	In place - nothing to report - info only
CORS Support	EGG	MOU	NGS	X	X	X	X	3	3	G	1-year extention in process - info only
World Mag Model	EGG	MOU	NGA	X	X	X		3	5	Y	**Modified; Awaiting NGA signature**

Other	Team	Type		NOAA Legal	DOC Legal	NOAA Signed	Partner Signed	Year	Duration	Status	
SWARM	EGG	MOU	NPOESS	X	X					Y	**Awaiting ESA; May be O.B.E.**

SEC-NGDC Summit
Action Items (draft)

AI-1 Determine which NWS SWx products are archived from the NOAA Weather Wire Service (NWWS)

AI-2 Determine the status of SEC datasets and products archived within NGDC

AI-3 Establish a Data Interface Working Group (DIWG) to recommend roles & responsibilities for data sharing between SEC & NGDC

AI-4 Establish an Archive Interface Working Group (AIWG) to address the resource accommodations for current and future (new) SEC data products within NGDC

Note: Draft AI list forwarded to Ron Zwickl on 12Jul06

Technology Thrust Areas
STP Overview

- **Earth Geophysics Group (EGG)**
  - Natural Hazards Database
  - Continuously Operating Reference Station
  - Geomagnetic Data & Services
- **Space Environment Group (SEG)**
  - Space Physics Interactive Data Resource
  - Space Weather Analysis
  - CLASS Recon Force
  - Satellite SWx Data
  - Solar Data Services
  - Ionospheric Digital Database
- **Earth Observation Group (EOG)**
  - DMSP Archive, Products & Services

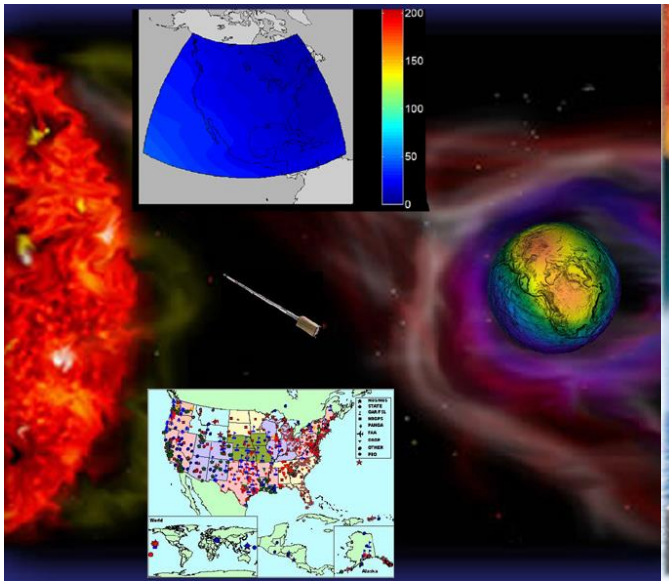
OUTLINE
STP Program Management Review

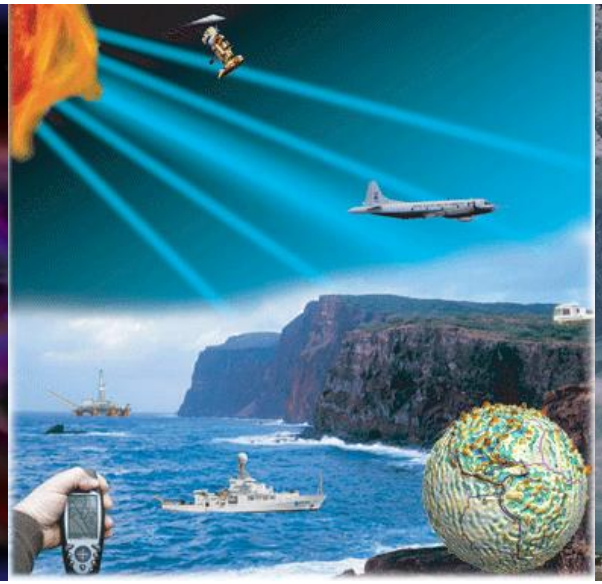
- STP Overview/Status
- Earth Geophysics Group
- Space Environment Group
- Earth Observation Group
- Concluding Remarks

Earth Geophysics Group
Overview

The focus of the EGG is to provide scientific stewardship, products, & services for data from Earth's physical environment supporting safe navigation and mitigating the impact of geophysical hazards. The EGG also supports international data collection, exchange and visiting scientists through the WDC.

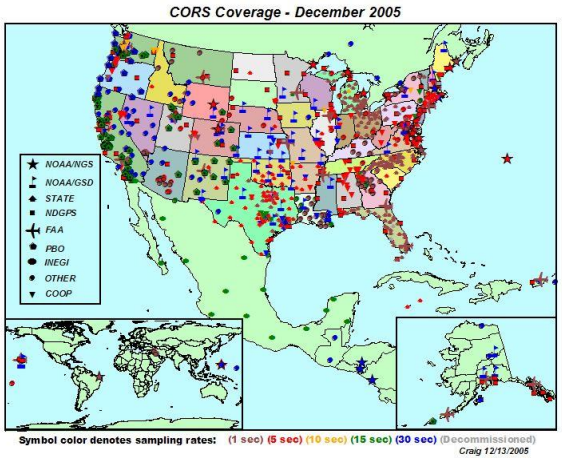
Team Lead: Susan McLean

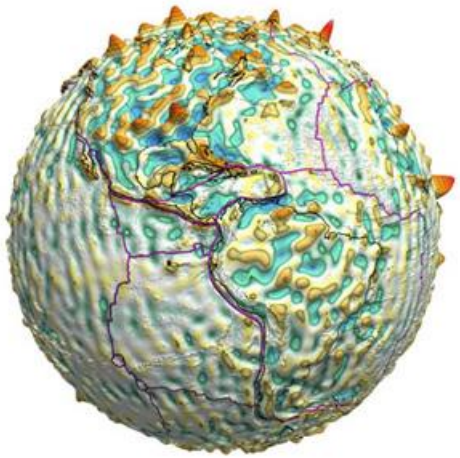





Earth Geophysics Group
Core Competencies

- **Management for GPS & geophysical datasets**
- **Monitor societal impacts of natural hazards**
- **Geomagnetic field modeling (for the DoD)**
- **Flagship products – Integrated Historic Hazard DB**
  World Magnetic Model
  GPS ground network datasets





STP/EGG Task
Natural Hazards Database

Prince William Sound Alaska Tsunami - 1964

Background – NGDC acquires, processes, analyzes & disseminates socio-economic & technical data on natural hazards, including earthquakes, tsunamis & volcanoes.

Purpose – Long-term data from natural hazards, including photographs, can be used to establish the past record of natural hazard event occurrences. These data are also important for planning, response and mitigation of future events.

Upcoming Milestones

2QFY06 – Review and document 60% of the deadly past tsunami events (***done***)

⇨ **2QFY06** – Increase volume of historic tsunami, DART, bathymetric & model data described, archived & accessible on-line (***done***)

Corporate Measure: % of NOAA tsunami observational data streams archived to NARA standards: 30% (FY06) - 100% (FY13)

⇨ Milestone in the AOP

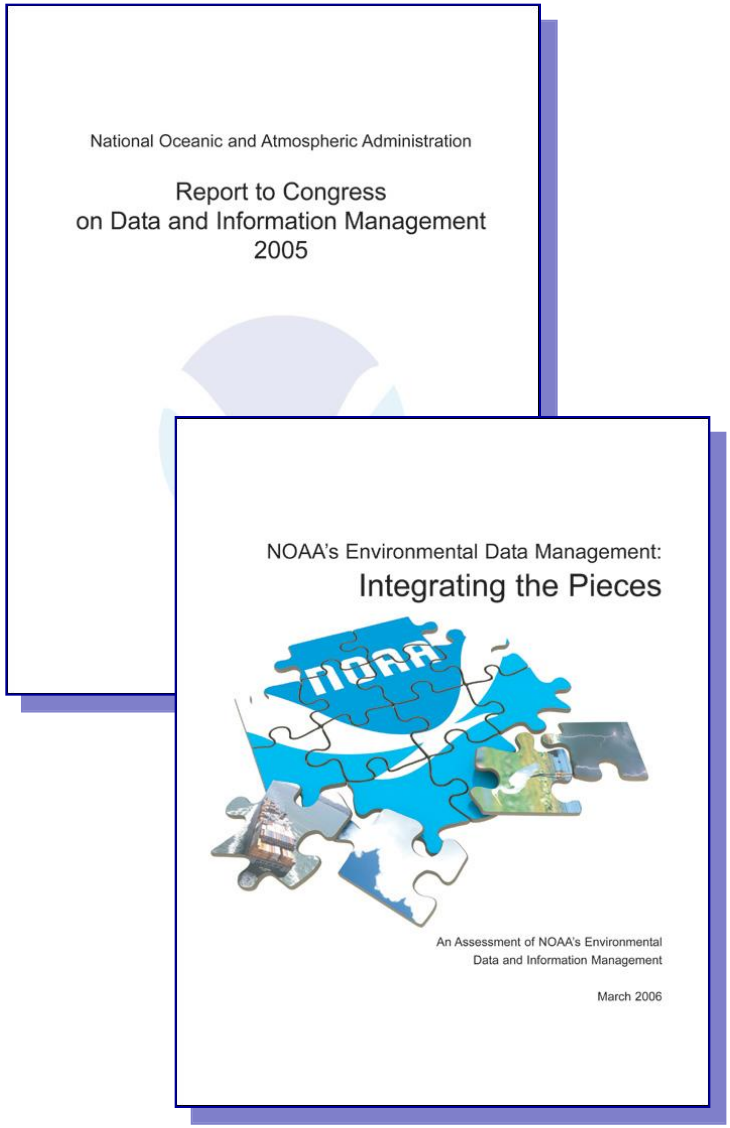
Team Members: Susan McLean, Paula Dunbar, Joy Ikelman, Karen Horan, Kelly Stroker, Jesse Varner, Tatiana Sazonova, and Ruth Brocko

Status: Focus on Hazard Assessment and Data Management Reports, PoP

Recent Deliverables: IT Planning Matrix, Tsunami Program Description, Corporate Measures

Tsunami program

Special Interest Item
NOAA Data Management Reports



Background

- Cross-Line Office and Cross-Goal team established October 2004
- Developed a comprehensive and sustainable assessment strategy
- Worked with the 45 Program Managers, four Mission Goal leads, and Support Mission sub-Goal leads
- Identified successes and challenges to NOAA data management
- Published results in the two reports to the left

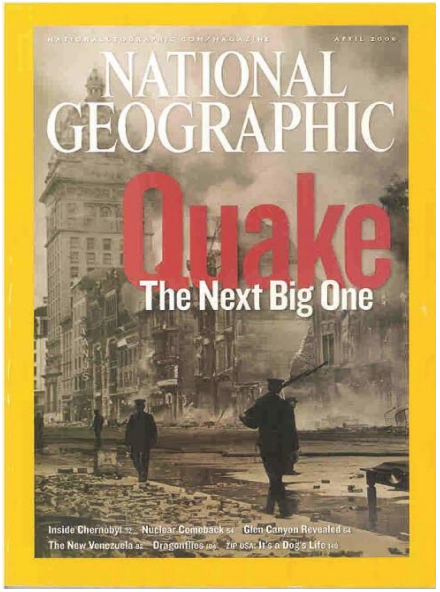
Significance

- First full comprehensive assessment of NOAA's data systems categorized by Mission Goal
- Identified common challenges
- Established a framework
- Resulted in a Report to Congress and a detailed NOAA management report

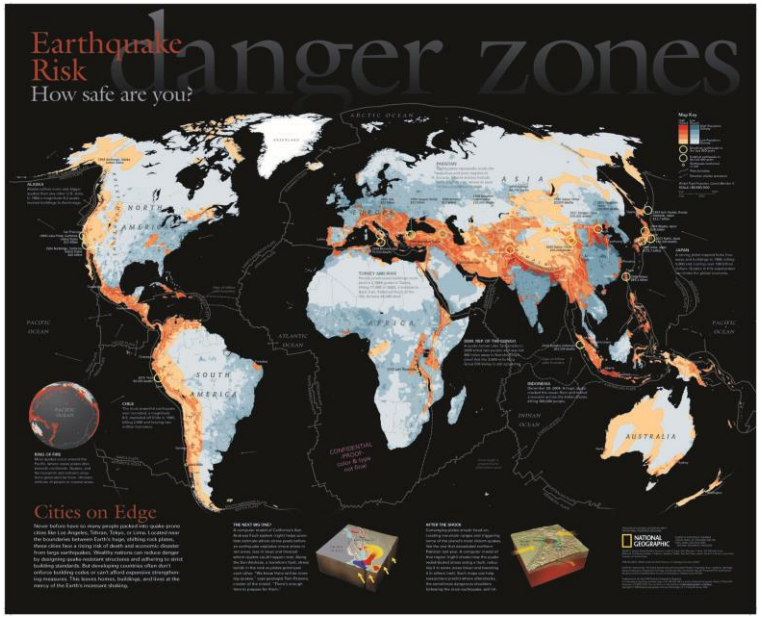
Accessibility

- Available on-line in PDF format NOAA / NOSC http://www.nosc.noaa.gov/docs/products.html and soon NGDC NOAA Reports

Special Interest Item
Earthquake Risk, A Global Assessment



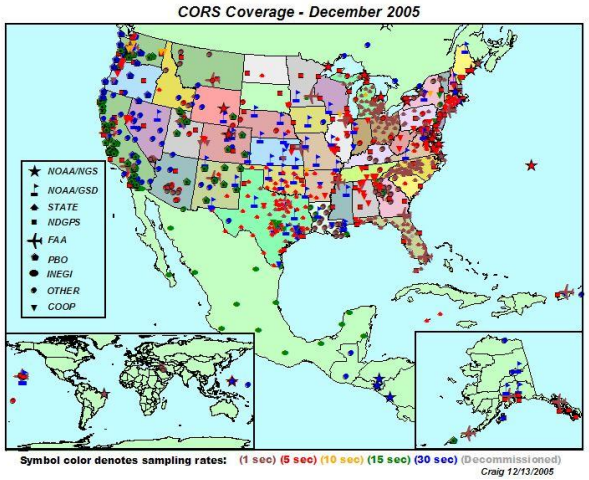
Background: The April 2006 issue of National Geographic Magazine credits NGDC as the source of hazards data for the map titled "Earthquake Risk" which appeared as magazine supplement. NGDC provided the National Geographic Society with various lists of earthquakes from the NGDC Significant Earthquake and Tsunami Event Databases from which National Geographic researchers identified the ten deadliest and ten costliest earthquakes since 1900. These are plotted on the magazine supplement.



Significance: This effort is in support of NOAA's mission to provide timely and accessible global environmental observations and life-saving warnings and forecasts to decision makers and to the general public. NGDC's earthquake and tsunami databases are used in disaster preparedness and response.

STP/EGG Task
Continuously Operating Reference Station

CORS Coverage



Background – NOAA / NGS coordinates a network of continuous GPS receivers for 3-dimensional positioning activities throughout the US and its territories.

Purpose – NGDC is an operational backup for the primary NGS site (in Silver Spring, MD). NGDC also supplies CORS data in near real-time to NOAA SEC and GSD for use in ionospheric and weather specification and forecast models.

Upcoming Milestones

2QFY06 – Increase volume of CORS GPS data ingested annually & placed into the archive by 2 TB (***done***)

MOU Status – A 1-year extension to the NGS / NGDC Agreement for CORS-West is in draft stage (at NGS) - work on a new 3-year agreement deferred until fall 2006.

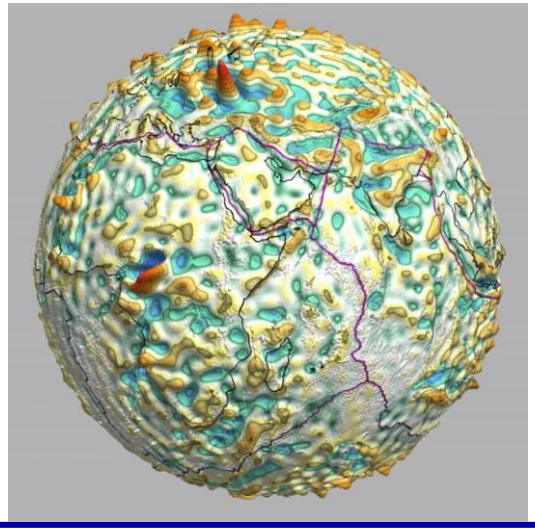
Team Members: Susan McLean, Ron Buhmann, Ernie Joynt, Rob Prentice (10%), Karen Horan, Vacancy – CIRES PRA re-advertised July 2006

Status: Re-advertised the CIRES position. Expect new NGS PhD to begin at NGDC in mid-to-late August. NGDC will host NGS Presidential Management Fellowship employee 6 months (FY07)

Marine Transportation System program

STP/EGG Task
Geomagnetic Data & Services

Crustal Magnetic Field



Background – The WMM is the standard magnetic model used by US military/civilian agencies and allied nations. The WMM is a product of the United States National Geospatial-Intelligence Agency. NGDC and the British Geological Survey jointly produce the WMM.

Purpose – The WMM satisfies requirements supporting navigation and attitude/heading referencing systems.

Upcoming Milestones

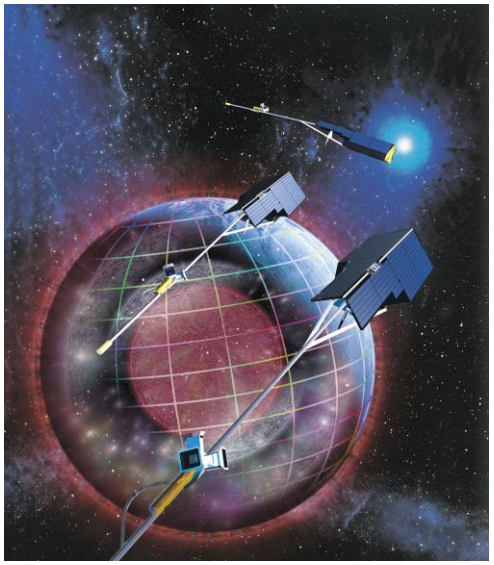
4QFY2006 – Improve resolution of crustal mag field from degree 90 to degree 720 to improve Electronic Navigation Chart (ENC) navigation models

Team Members: Susan McLean, Stefan Maus, Tanya Sazanova, Karen Horan, Patrick Alken, Chris Hammond, Andrew Kimbrel, Don Herzog

Status: Task continuing on track. Dr. Maus is spending the summer at *Institut de physique du globe de Paris* studying crustal magnetic field dynamics. SWARM interactions are currently on-hold.

Marine Transportation System program

Special Interest Item
Status of SWARM



Background:

- The objective of the Swarm mission is to provide the best ever survey of the geomagnetic field and its temporal evolution, and gain new insights into improving our knowledge of the Earth's interior and climate.
- The Swarm architecture consists of a constellation of three identical satellites in three different polar orbits between 300 and 530 km altitude.
- The satellites provide magnetic field and ionospheric plasma measurements which are valuable for real-time space weather monitoring.

Key Points:

- SWARM data satisfies the NPOESS Magnetic Field EDR requirement and the NGDC (DoD) needs for producing the World Magnetic Model.
- NESDIS has entered into discussions with ESA regarding the use of the NPOESS SvalSat antenna to download the SWARM data in near-real time.

Status:

- On 03-Jul-06 Mr. Withee met with Dr. Volker Liebig (Director of ESA's Earth Observation Programmes) regarding a number of topics. Interest in mutual cooperation in SWARM has cooled significantly and the NPOESS downlink may no longer be a viable consideration. This will not impact our ability to get SWARM magnetic field data for the WMM.

Accomplishments
Earth Geophysics Group

- **Report to Congress on NOAA's Data Management complete**
- DART Retrospective Archive established; data and metadata online
- Completed QA / QC of ~40% of the historic tsunami database
  - 100% of US coastal runups, 60% of deadly events
  - Contributed to March 2006 National Geographic map on earthquake hazards
- Added 4,457 Volcanic Events to historic event database
- CORS archive increased from 12 Tb (Q2) to 14.5 Tb (Q3)
- **Expanded SEC CORS data services to include Canadian GPS data at 15-minute latency**
- Staff attended several major conferences, presented papers / posters, worked with data providers
- **14 papers published in peer-reviewed journals (2005-2006)**
  - 6 papers submitted or in print

Issues & Concerns
Earth Geophysics Group

- **Vacancies**
  - **CIRES PRA Geodesist (advertised , offer made and declined June 2006, position re-advertised July 2006)**
- **NTHMP Hazards Assessment**
  - **Multi-agency effort (NOAA, USGS, States, & University)**
  - **Paula Dunbar NOAA lead**
  - **Final deliverable due October 2006**
- **Serving Times Series Data**
  - **Reviewing content & capability for geomag data in SPIDR**
  - **Expanding geomagnetic station histories in SPIDR**
  - **Moved the DART data to Oracle where new dynamic plot capability is being developed**

NTHMP = National Tsunami Hazard Mitigation Program

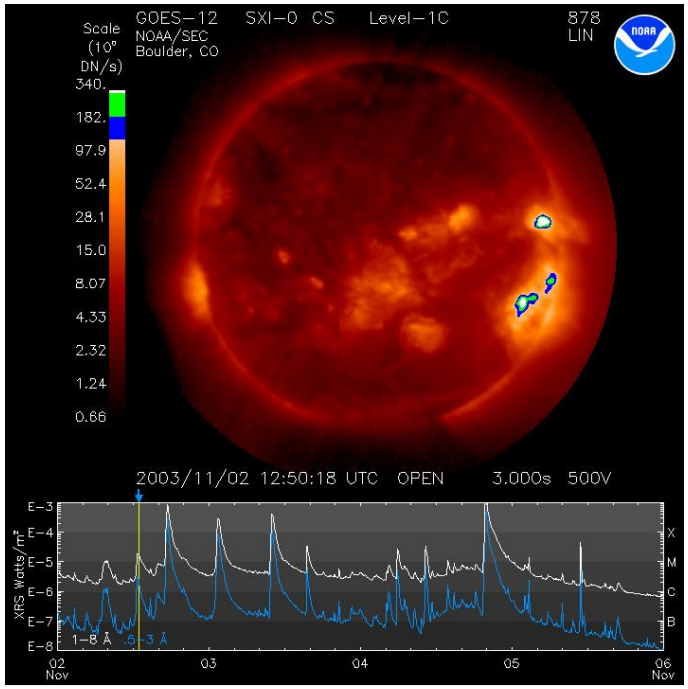
OUTLINE
STP Program Management Review

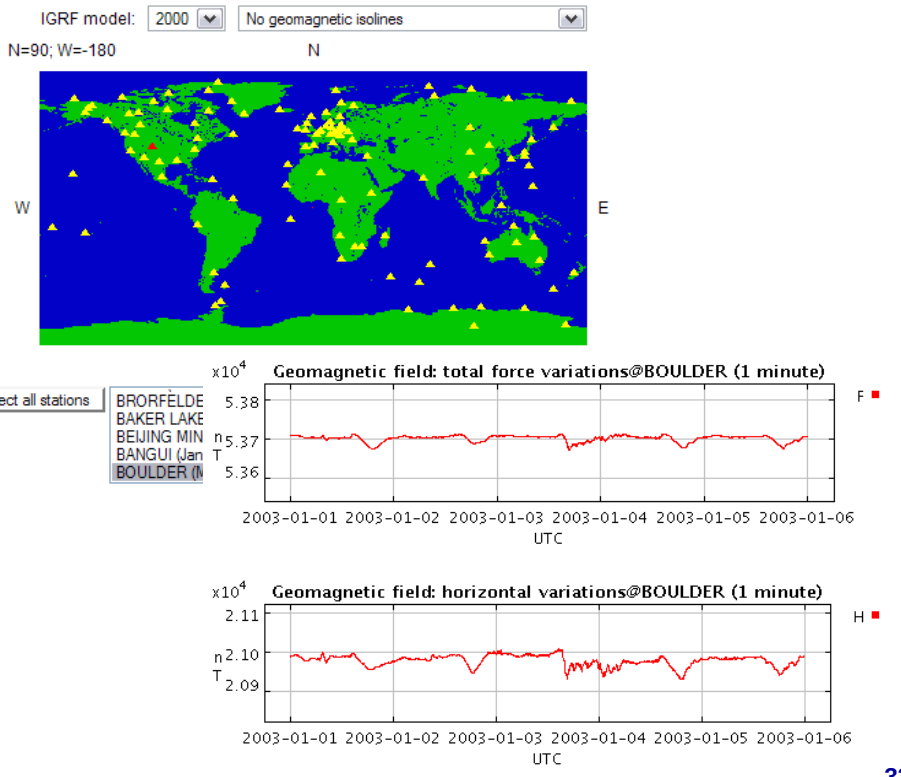
- STP Overview/Status
- Earth Geophysics Group
- Space Environment Group
- Earth Observation Group
- Concluding Remarks

Space Environment Group
Overview

The Space Environment Group is focused on the archive and management of NOAA's space environmental data. The SEG also supports international data exchange and collection through World Data Center activities.

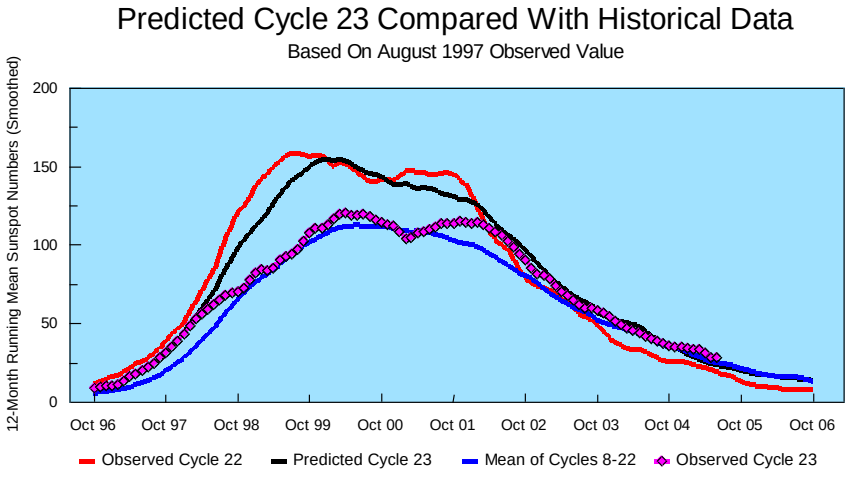
Team Lead: Dr. Eric Kihn

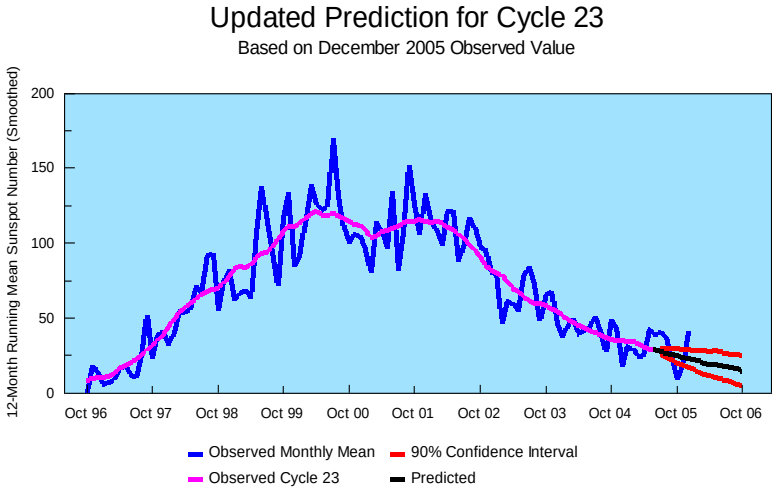




Space Environment Group
Core Competencies

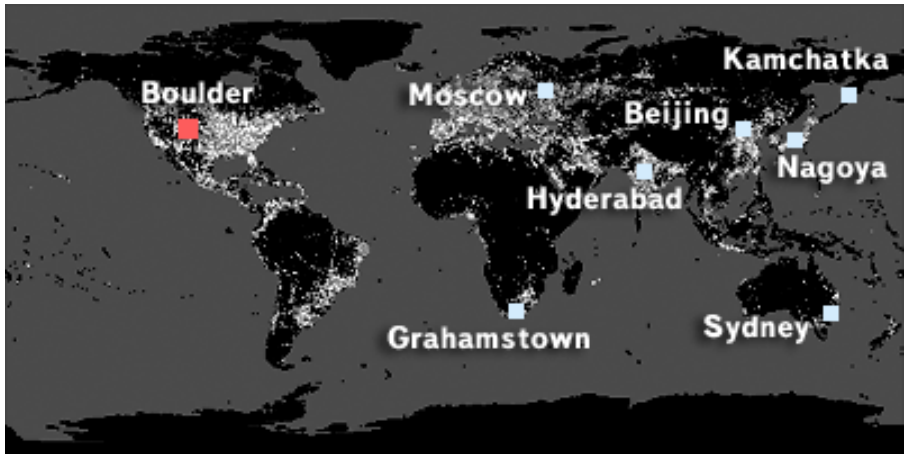
- **Management of space environmental data**
- **Publisher of solar–geophysical indices**
- **Archivists of GOES/POES/DMSP space data**
- **Development of ionosonde QA/QC tools**
- **Flagship product – SPIDR**





STP/SEG Task
Space Physics Interactive Data Resource

Global SPIDR mirror sites



SPIDR nodes as of January 2006.

Background – SPIDR is a distributed network of synchronous databases and 100% Java middle-ware servers accessed via the World Wide Web. SPIDR 4.0 is in test phase.

Purpose – SPIDR allows a solar terrestrial physicist to intelligently access and manage historical space data for integration with environmental models and space weather forecasts.

Milestones

1QFY06 – Complete PCI data rescue (***done***)

➡ **4QFY06** – Publish SWA derived products such as indices via the web

➡ **1QFY07** – Integrate CDAWeb with SPIDR

Corporate Measure – % archived SWx data available on-line: 59% (FY06) to 95% (FY12)

➡ Milestone in the AOP

Team Member: Eric Kihn, Rob Redmon, Kristen Mihalka (Mikhail Zhizhin)

Status: Investigations into "bad" data in SPIDR continue – upcoming IRI meeting, 16-20 Oct, Buenos Aires. Dr. Kihn participated in the NASA Data Center Review at the Goddard Space Flight Center, 30Apr – 03May.

Space Weather program

Issue For The Director
Bad Data in SPIDR (1 of 4)

Issue: Problems with ionospheric data available through SPIDR

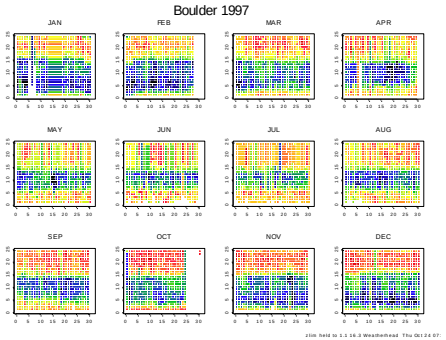
Background: SEC has brought to our attention various problems with the ionosonde database included in SPIDR. There are three issues that need to be addressed (see next slide). Some of these problems have been known for some time. The utility of data within SPIDR and the credibility of NGDC are at stake.

Status: Rob Redmon has been overseeing the efforts of Kristen Mihalka investigating problems previously identified with the ionosonde database. Some of the problems found by SEC are still under investigation. Other problems have been found and efforts are underway to identify their sources. NGDC (RR) will present a status update on these issues at the IRI Workshop 2006 – "New Measurements for Improved IRI TEC Representation" in Buenos Aires, Argentina (16-20 October 2006).

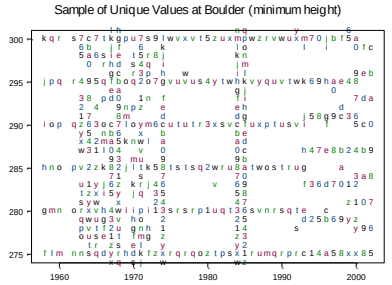
Action for the Director: Info only. No action required at this time.

Issue For The Director

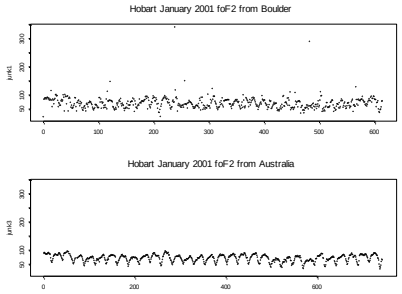
Bad Data in SPIDR (2 of 4)



Issue 1 – There are artifacts in the ionosonde data that appear to be due to repeating values. These appear as stripes in the figure to the left.



Issue 2 – The resolutions with which ionospheric heights are determined have changed with time.



Issue 3 – Data within SPIDR is different from that available through other SPIDR nodes. Annual SPIDR "synch" may have corrupted other data sets.

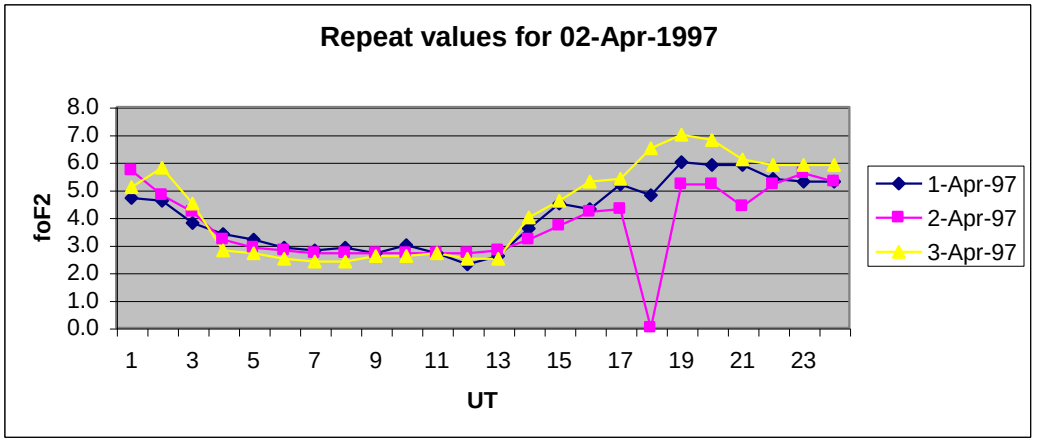
Issue For The Director
Bad Data in SPIDR (added)

Issue 1 – There are artifacts in the ionosonde data that appear to be due to repeating values. These appear as stripes in the figure to the left.

Initial finding – Given the limited # of significant digits this doesn't appear to be of great concern.

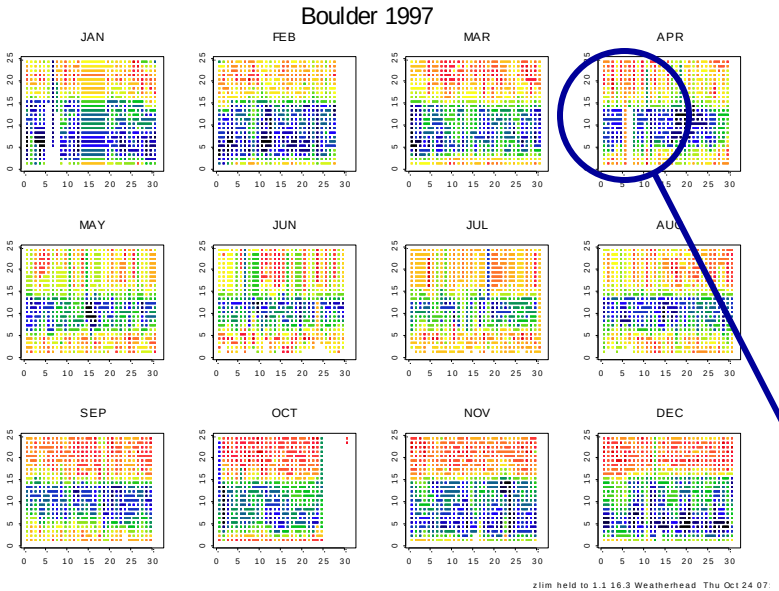
UT	1-Apr-97	2-Apr-97	3-Apr-97
0	4.7	5.7	5.1
1	4.6	4.8	5.8
2	3.8	4.2	4.5
3	3.4	3.2	2.8
4	3.2	2.9	2.7
5	2.9	2.8	2.5
6	2.8	2.7	2.4
7	2.9	2.7	2.4
8	2.7	2.7	2.6
9	3.0	2.7	2.6
10	2.7	2.7	2.7
11	2.3	2.7	2.5
12	2.6	2.8	2.5
13	3.6	3.2	4.0
14	4.5	3.7	4.6
15	4.3	4.2	5.3
16	5.2	4.3	5.4
17	4.8	0.0	6.5
18	6.0	5.2	7.0
19	5.9	5.2	6.8
20	5.9	4.4	6.1
21	5.4	5.2	5.9
22	5.3	5.6	5.9
23	5.3	5.3	5.9

6 "Repeated" Values



Issue For The Director

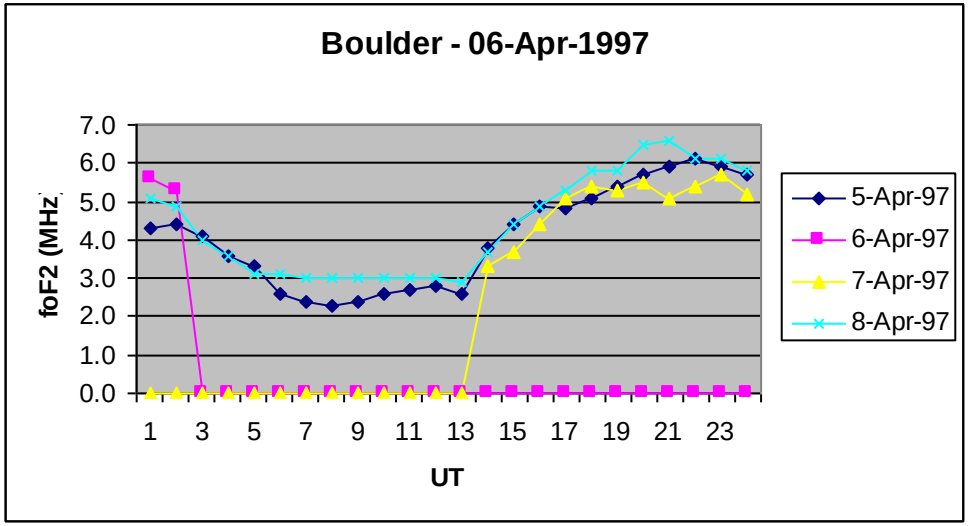
Bad Data in SPIDR (added)



Issue 1 – Stripes in the 1-hour Boulder foF2 records.

Plotting issue – "Zero" levels on two successive days show up as different color stripes

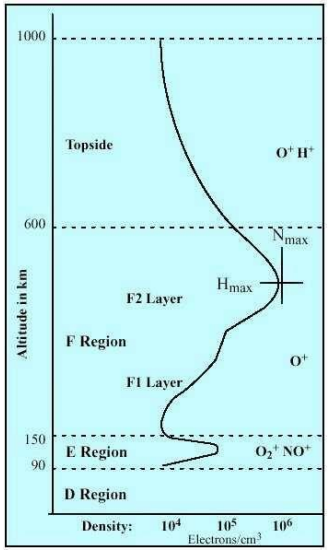
In general, the striping appears (at first glance) to be a systemic problem in how these plots were created



Issue For The Director

Bad Data in SPIDR (3 of 4)

Need tools to quickly QC data

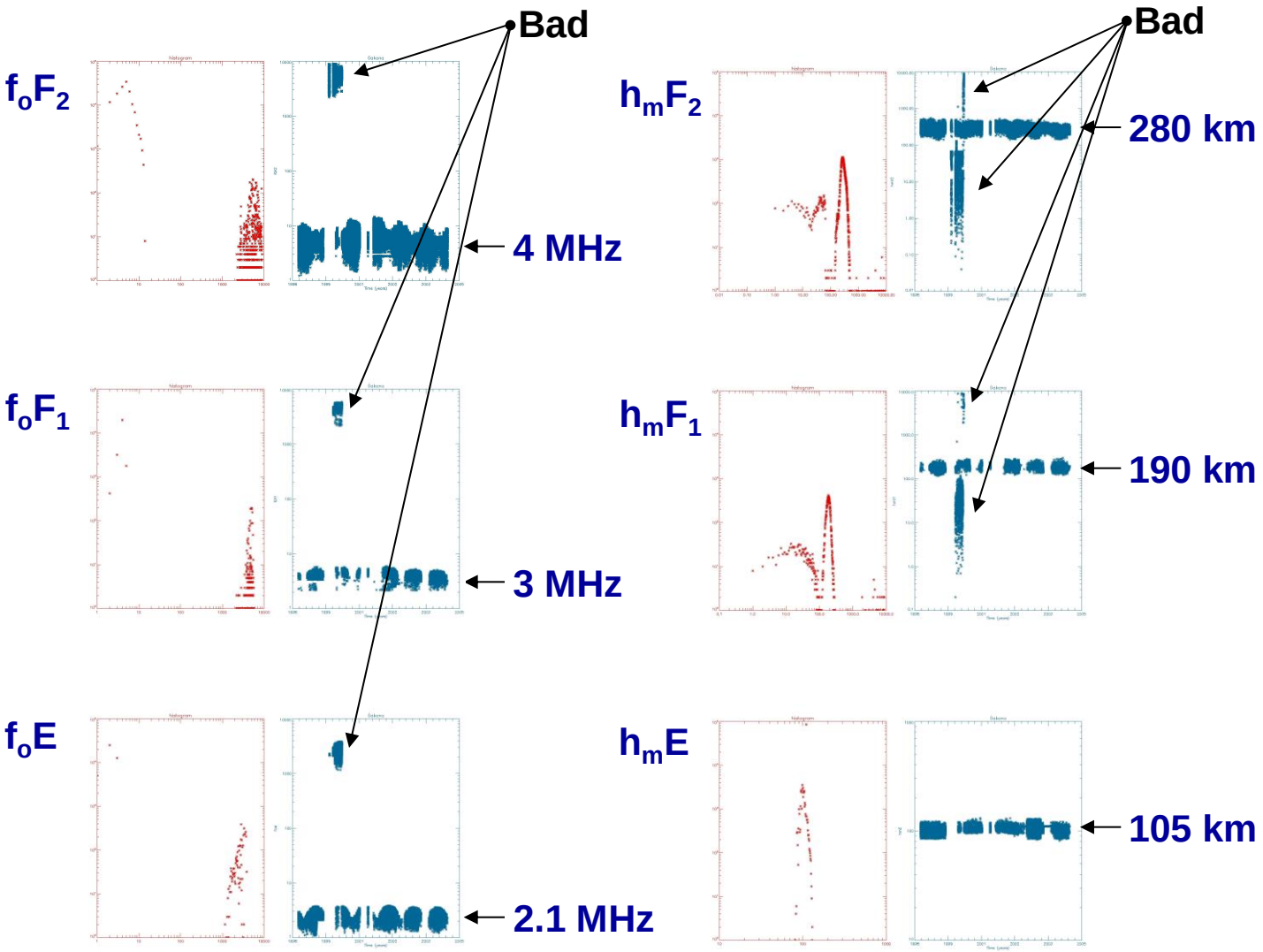


Key:

1 MHz = 1.4×10^4/cc

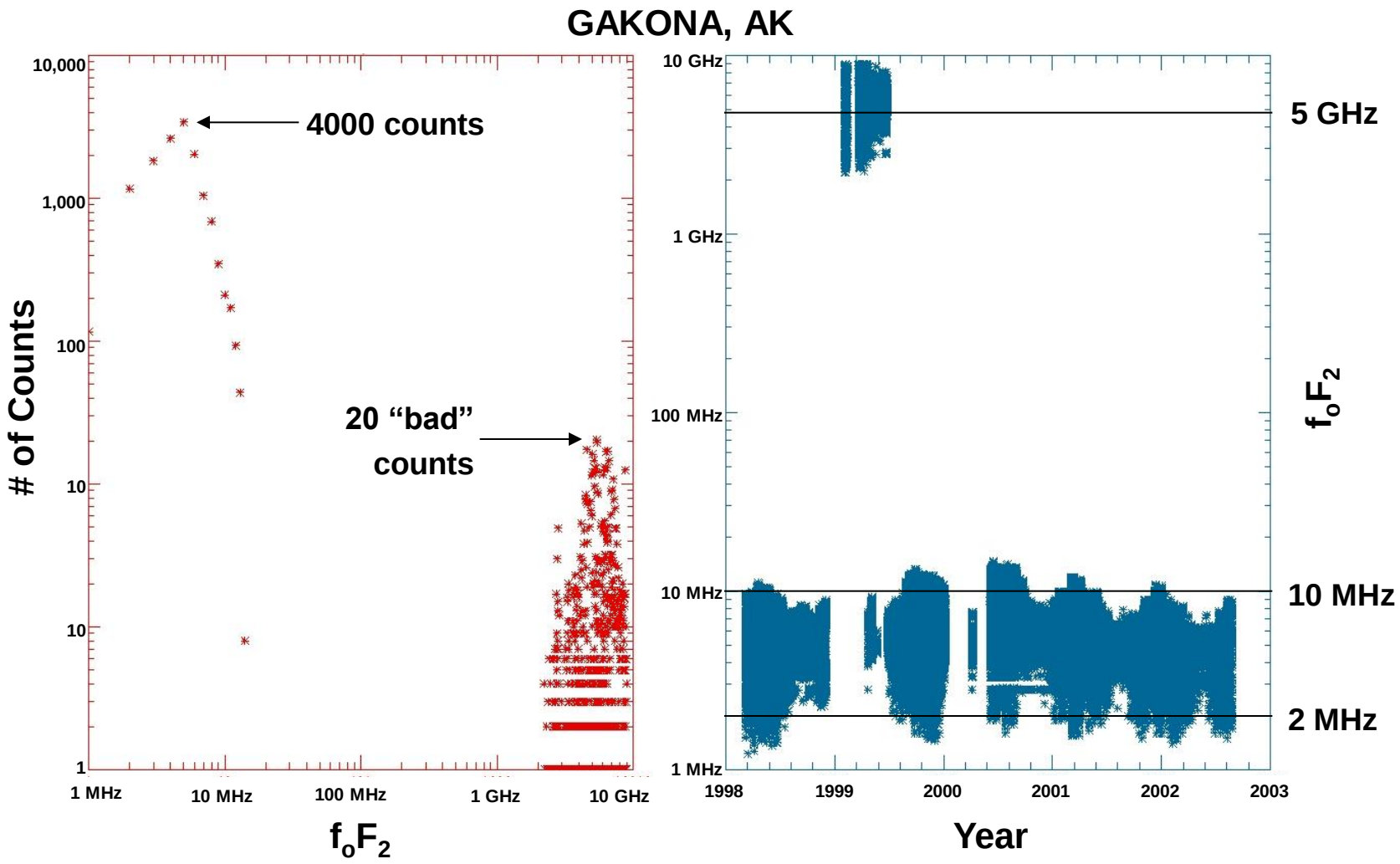
2 MHz = 4.9×10^4/cc

3MHz = 1.1×10^5/cc



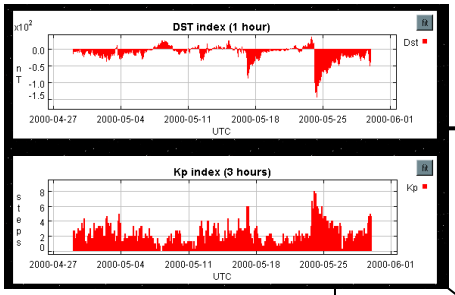
Survey Plots of Derived Ionospheric Parameters

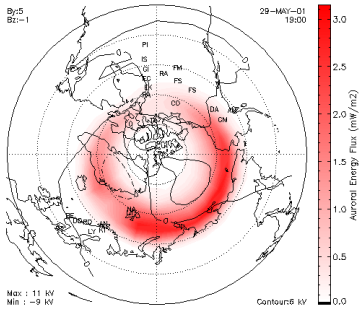
Issue For The Director
Bad Data in SPIDR (4 of 4)

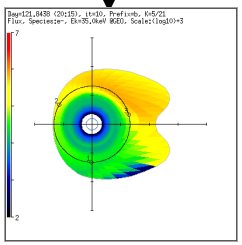


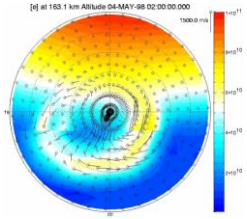
Data in SPIDR are mostly reasonable and expected

STP/SEG Task
Space Weather Analysis









SWA Data Flow

Purpose – The objective of this project is to generate a complete 16-yr space weather representation using physically consistent data-driven space weather models. The project will create a consistent, integrated, historical record of the near Earth space environment by coupling observational data from space environmental monitoring systems archived at NGDC with data-driven, physically based numerical models.

Upcoming Milestones

➡ **2QFY06** – Construct a 15-year gridded database of results from linked assimilation models (***done***)

➡ Milestone in the AOP

Team Members: Eric Kihn, Rob Redmon and Aaron Ridley

Status: This project has now created a consistent, integrated historical record of the near-Earth space environment by coupling observational data with physics-based numerical models. Effort supported by AF/CCC funding.

Space Weather program

STP/SEG Task
CLASS Recon Force

Comprehensive Large Array-data Stewardship System

Background – CLASS is the archive and distribution system for NOAA's large array data. NGDC is getting a node.

Purpose – NGDC would like to rapidly proto-type and develop an "open-CLASS" architecture capable of integrating many of NGDC's diverse data sets with the CLASS-ADS.

Status

2QFY06 – Project plan to C. Fox

3QFY06 – Interface specification complete

4QFY06 – Proto-type system operational

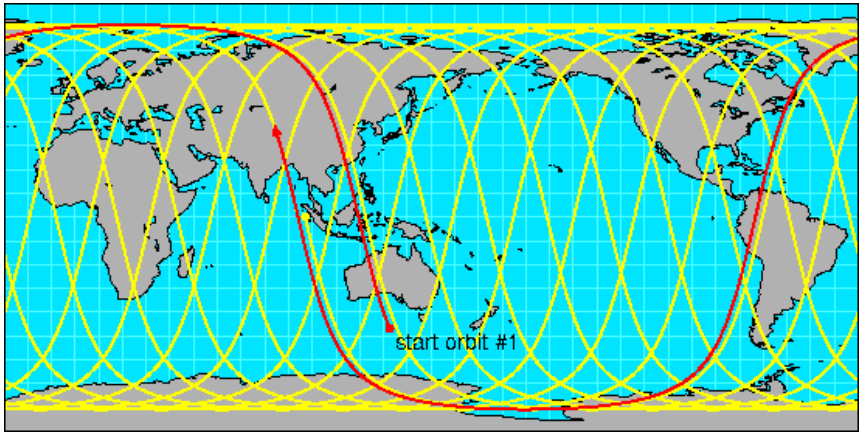
Team Members: Eric Kihn, Rob Redmon, Rob Prentice, Mikhail Zhizhin, Ted Habermann

Status: Rob Prentice is developing a demo and benchmark tools to illustrate the feasibility of extracting metadata from a native XML database using the XQuery API. A CLASS workshop is scheduled for 07-08 Aug in the NIST auditorium.

Space Weather program

STP/SEG Task
Satellite SWx Data

POES daily orbits



Background – NGDC maintains a 30-yr historical database of satellite SWx data from DMSP, POES, and GOES

Purpose – Satellite data are used to determine extremes in SWx conditions and monitor long-term variations in the space environment. These data are also used in specific case studies in coordination with other space data.

Upcoming Milestones

2QFY06 – Publish Looking-Forward-to-GOES-R web announcement (***done***)

4QFY06 – Complete migration of SWx data to ADIC TLS; GOES SEM, POES SEM and GOES SXI (***done***)

Team Members: Dan Wilkinson, Ed Erwin

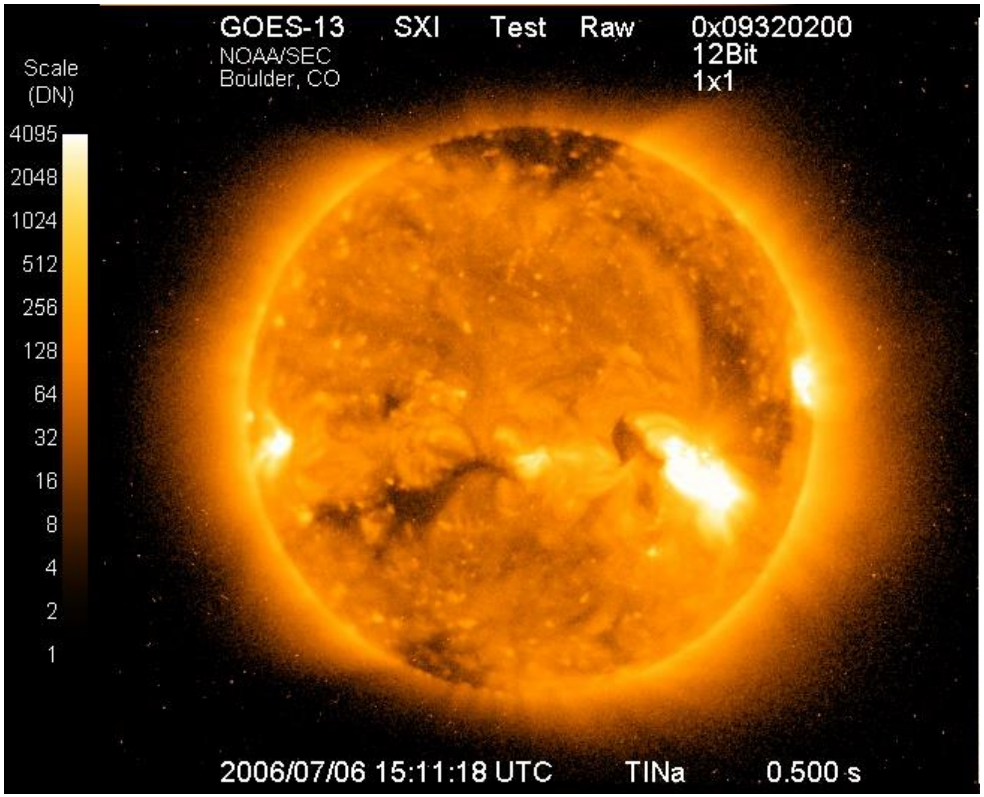
Status: NOAA-18 data have been reprocessed by SEC in order to apply proper calibration values. Nearly 1 year of data were affected and will be published on NGDC's web site with text describing the necessity of the reissue of the data.

Space Weather program

Special Interest Item
GOES-13 SXI @ NGDC

<u>Statement:</u> NGDC in coordination with the NWS/SEC has now made GOES-13 SXI data available to users and the scientific community.

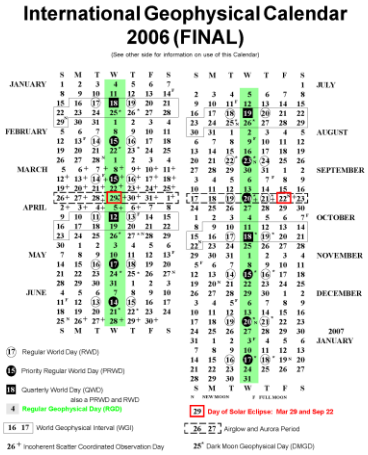
GOES-13 Solar X-ray Imagery

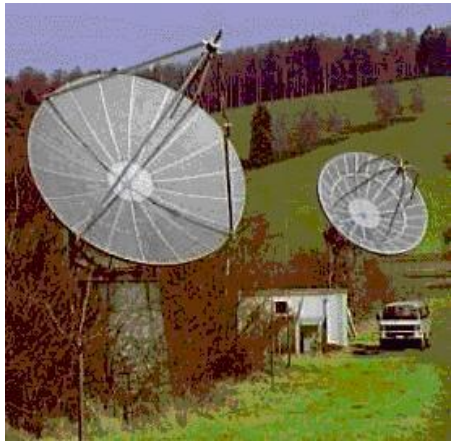


<u>Background:</u> NGDC is the national archive for the GOES-13 space environmental data. SXI imagery is processed within the NWS/SEC and made available to NGDC for user dissemination. NGDC and SEC are working to improve data connectivity with a goal to provide user access to the SXI data with a latency of NLT 5 minutes.

<u>Significance:</u> Real-time access to SXI imagery will help foster commercial space weather services from NOAA satellite data.

STP/SEG Task
Solar Data Services


International Geophysical Calendar
2006 (FINAL)



http://www.ngdc.noaa.gov/stp/SOLAR/solar.html

Background – The Solar Data Services group handles, archives and distributes solar data from the following disciplines; solar phenomena, solar flare-associated events, cosmic rays and solar publications.

Purpose – Provide a permanent repository for solar data to monitor changes in the sun and to track the influences that the sun has on our lives and environment.

Upcoming Milestones

2QFY06 – RSTN data rescue (***done***)

3QFY06 – Add 50 GB of high resolution daily solar H-alpha images to NGDC archives (***done***)

Corporate Measure – Improved retrospective products for understanding the space environment: 3 (FY06) to 6 (FY12)

Team Members: Helen Coffey, Ed Erwin, Dan Wilkinson, Chris Wilkinson (EGG)

Status: The RSTN fixed-frequency data through 2004 have been quality checked and loaded into SPIDR. The data are now available for user browsing and plotting. NGDC/LASON is continuing to scan full disk Boulder solar H-alpha images at 4000 dpi (about 12 images/day).

Space Weather program

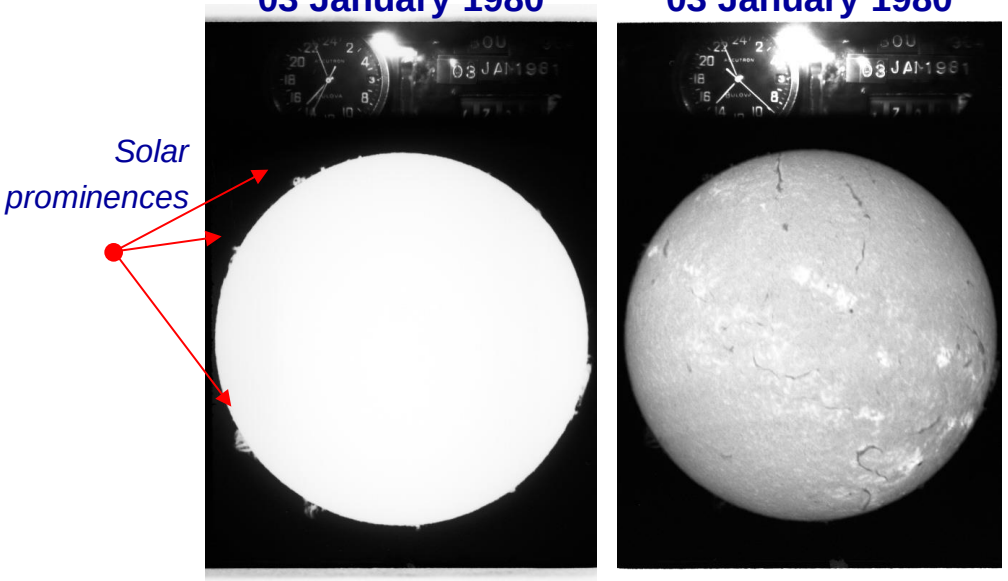
STP/SEG Milestone
Solar Data Services

Milestone – Add 50 Gigabytes of high resolution daily solar H-alpha images to NGDC archives.

Background – This task concerns the migration of historical solar observations currently available on microfilm & paper form to digital image format. Images include daily Boulder Solar Observatory H-alpha film scans (1967-76), Beograd white light photos (1957-58), Boulder Solar Observatory sunspot drawings (1966-91), Annals of the IGY composite drawings (1957-58), McMath H-alpha & Calcium K line scout photos (1948-79), McMath Calcium drawings with reduced data (1942-60), and some other miscellaneous databases.

Boulder H-alpha

03 January 1980 **03 January 1980**



Completion Date - Planned: (Q3) 6/30/2006 Current: (Q3) **Completed** (5/30/2006)

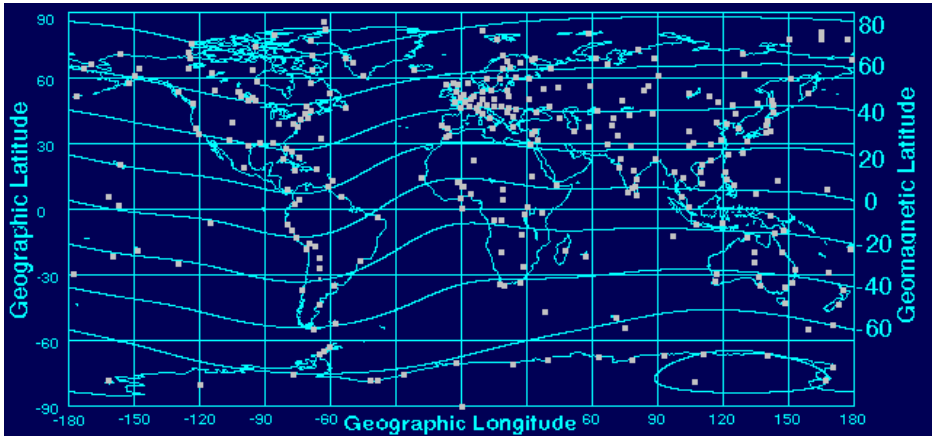
Status – Done. During 1QFY06 NGDG received 83 DVDs with 12,000 images covering the period from Sep 1977 to Jan 1980. Total new data is 270 GB (110 GB/Data-Yr).

Web: ftp://ftp.ngdc.noaa.gov/STP/SOLAR_DATA/SOLAR_IMAGES/

Cognizant Person: Helen Coffey Program: Space Weather

STP/SEG Task
Ionospheric Digital Database

Global Ionosonde Network



Background – Ionograms are recorded tracings of reflected ionosonde radiowave. Reflected radiowaves provide critical information on the bottomside ionosphere up to the F_2 peak in electron density.

Purpose – Historical ionogram records are used to monitor ionospheric variability and extremes. Efforts are underway to make current measurements available in near real-time to support SWx operations.

Upcoming Milestones

4QFY06 – Automate the collection, analysis, archive and dissemination of the USAF ionospheric sounding stations

Team Members: Rob Redmon, Terry Bullett, Ray Conkright, Justin Mabie

Status: The Mirrion project continues. SEC has stated a requirement for continuous ionosonde data. No progress has been made on the transfer of ionosonde ownership from AFWA. An SEC concern on the reliability of the NGDC ionosonde database is being addressed.

Space Weather program

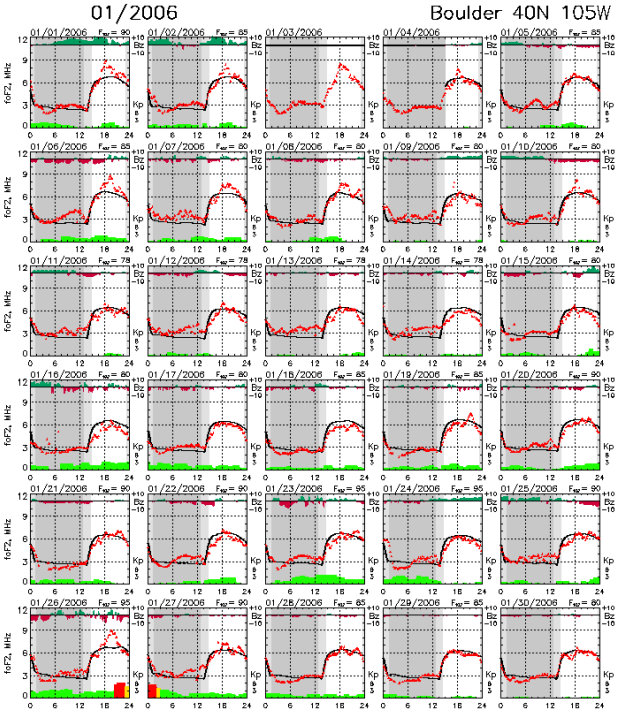
Special Interest Item
NGDC Ionospheric Services

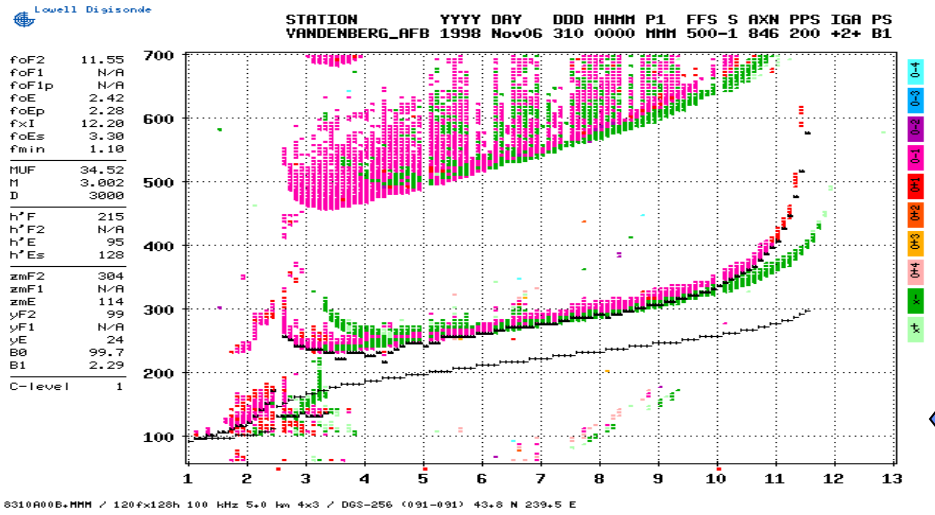
<u>Statement:</u> Recent developments have increased NESDIS capability for supporting space weather operations within NWS/SEC & AFWA

<u>Background:</u> Ionospheric data from approximately 50 ionosondes world-wide are currently being ingested & processed within NGDC. Data are made available to users in near real-time for space weather (SWx) modeling and customer products.

<u>Significance:</u> Improved SWx specifications help minimize errors in GPS navigation & HF–comm.

Diurnal variations in electron density measured at Boulder



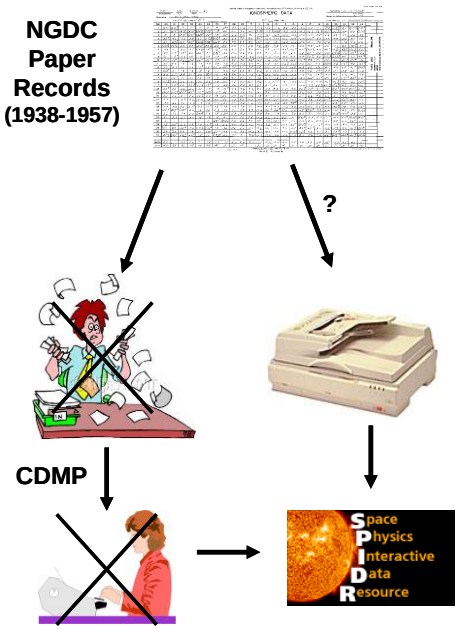


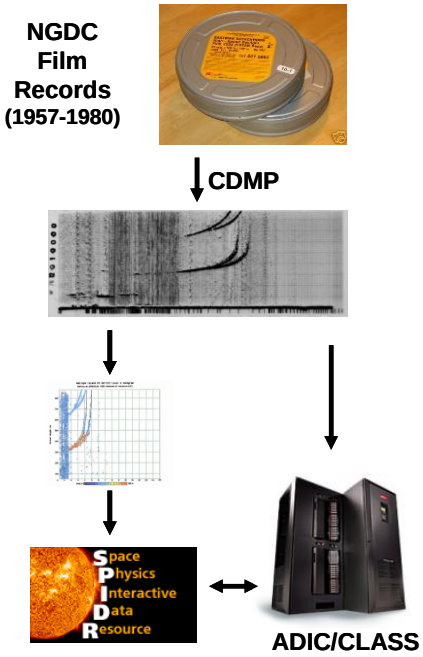
Swept frequency "time-of-flight" ionosonde echoes processed in real time

Special Interest Item
CDMP Ionosonde Data at NGDC

Background: CDMP program for processing historical ionosonde records has been redirected. Rather than processing historical ionosonde records on paper the program will now digitize historical film ionograms which will be made available on-line and processed using expert software into standard ionospheric features.

Status: Digitized ionograms undergoing testing for image quality and applicability in expert system. Techniques for lossless data compression being evaluated to reduce archive storage requirements.





Accomplishments
Space Environment Group

- Annual SEC-NGDC Summit held 08 May
- **GOES-13 SXI now being ingested in RT within NGDC**
- SWW-2006 – 25-28 April – 3 posters + 1 invited talk
- **NGDC cited for "essential" contributions - SWx Journal**
- Participation in National SWx Program assessment
- Foreign visitors – P. Cilliers (S.A.) / E. Donavan
- Expert guidance provided to ISO on space standards
- **Joe Allen honored as "Life Member" at SCOSTP mtg**

SCOSTP = Scientific Committee On Solar-Terrestrial Physics

Issues & Concerns
Space Environment Group

- **Impact of CLASS on Staff Time – NGDC Mission Impact**
  - **Key SEG personnel (EAK/RJR) are being diverted to CLASS**
  - **SEG's core mission may be adversely affected**
  - **Recommend hiring a CIRES person to help maintain SPIDR**
- **Ionospheric Data Quality Issues**
  - **Problems within SPIDR currently under investigation**
  - **Kristen Mihalka (Hollings Scholar) reviewing SPIDR**
  - **Status report required for October IRI meeting, Buenos Aires**
- **Inbound FY06 Customer Funding**
  - **AF/CCC: $71K**
  - **NASA: $70K**
  - **AFWA: $150K**

OUTLINE
STP Program Management Review

- STP Overview/Status
- Earth Geophysics Group
- Space Environment Group
- Earth Observation Group
- Concluding Remarks

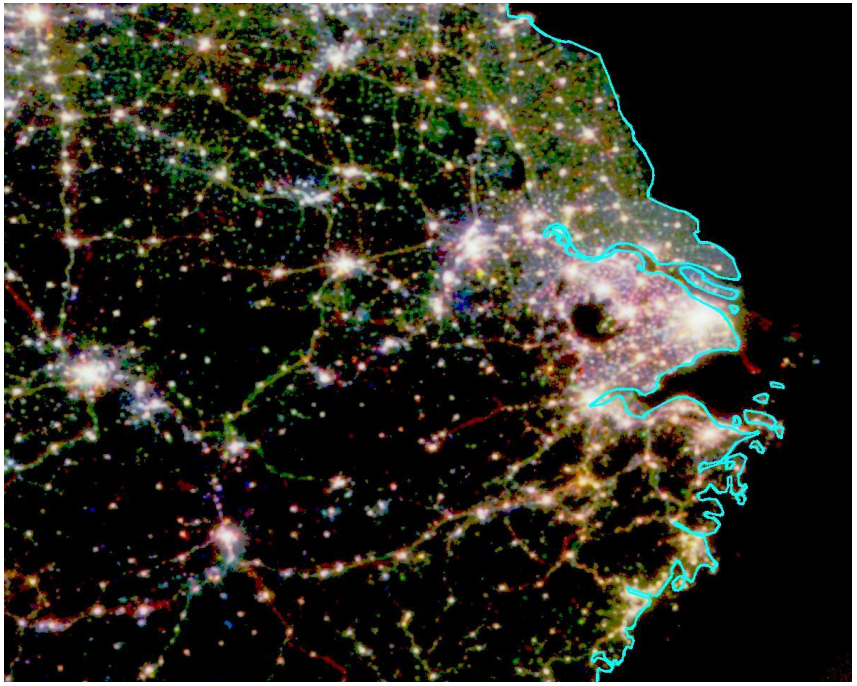
Earth Observation Group
Overview

The mission of the EOG is to provide archive data management (ingest, archive and access) for NOAA and other earth observation remote sensing data, development and production of higher-level products, development of data delivery / customer base, and participation with scientific communities

Team Lead: Dr. Chris Elvidge

- **Archive grows 15 GB/day**
- **Archive now at 56 TB[1]**
- **Annual composites are distilled from about 1 TB of geolocated OLS data**

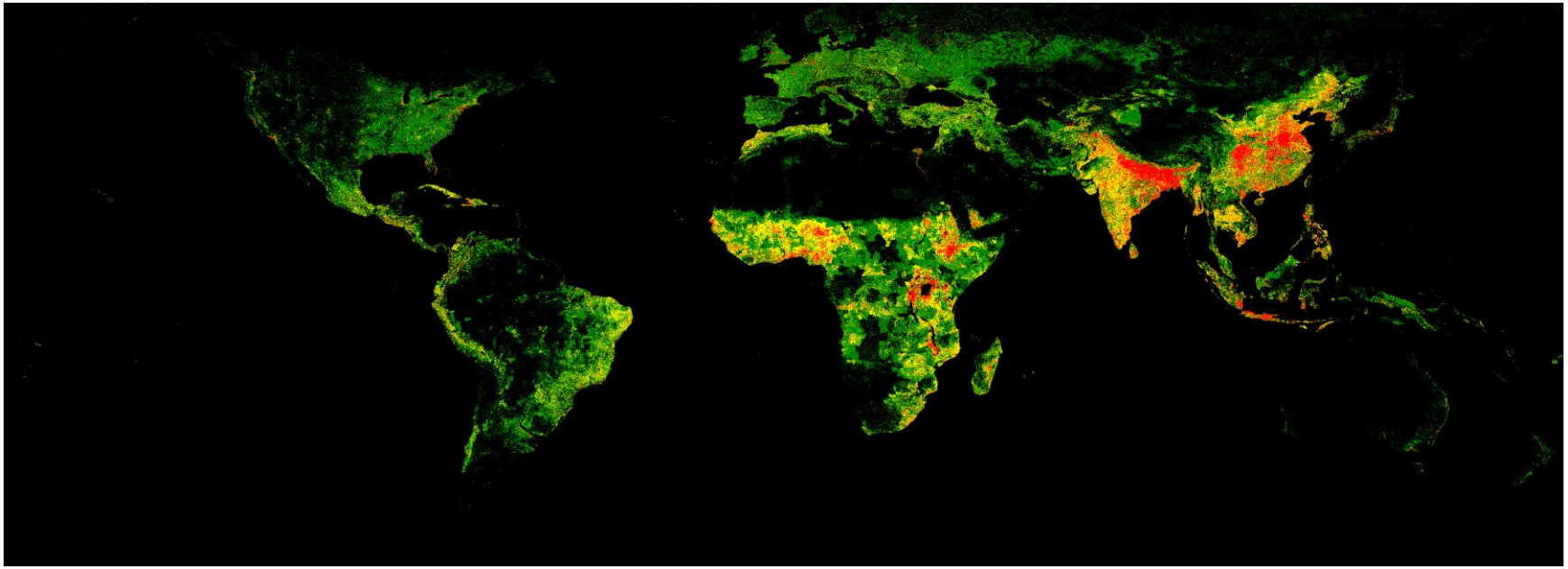
[1]Does not include DMSP "raw" data backup



DMSP-OLS Average visible band DN color composite of Shanghai (2003, 1998, 1992 as red, green, blue)

Earth Observation Group
Core Competencies

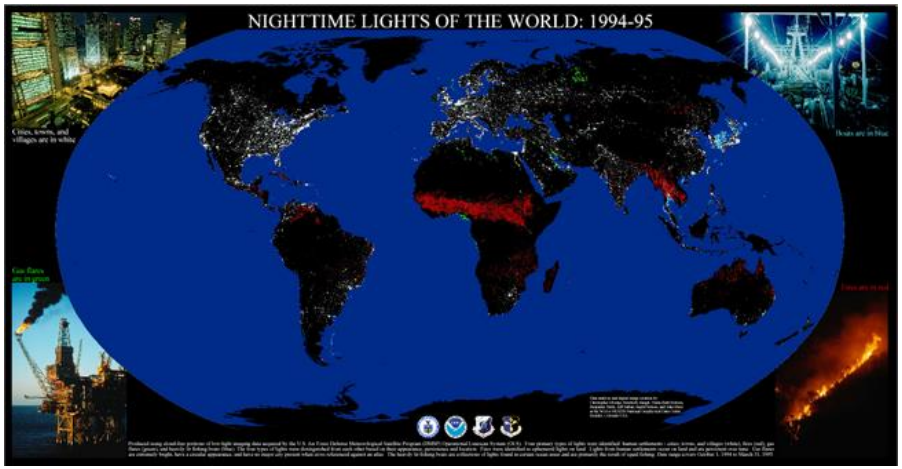
- **Data managers for EO data**
- **Large volume data ingest**
- **Large volume data processing**
- **Large volume data delivery**
- **Flagship product – Nighttime Lights**
  (Annual Composites, Lunar Cycle Composites and NRT)



First satellite derived global map of poverty. Green 1-10 persons in poverty per 30 arc second grid cell. Yellow = 11-50 persons in poverty. Red = more than 50 persons in poverty.

STP/EOG Task
DMSP Archive, Products & Services

NightTime Lights of the World



Background – DMSP OLS (visible and infrared) imagery from 1973 to present is used to observe lights from cities, fires, gas flares and fishing boats.

Purpose – DMSP NightTime lights are used to map changes in economic activity, population numbers and constructed area. The products are widely recognized as a key satellite observation of humanities presence on the land and ocean surface.

Upcoming Milestones

4QFY06 – Increase volume of DMSP tape library archive by 4 TB

4QFY06 – Deliver 3 TB of DMSP data on line

4QFY06 – Generate 1st global DMSP OLS imagery constructed on a 1-km grid

1QFY07 – Implement new near-real time satellite data processing & delivery system for DMSP OLS

Team Members: Chris Elvidge, Kim Baugh, Ara Howard, Pat Hayes, Ben Tuttle

Status: Version 2 time series posted on the www. 400+ sets downloaded in first month.

www.ngdc.noaa.gov/dmsp/global_composites_v2.html

Marine Transportation System program

Initiative - NRT Global Mosaics
Earth Observation Group

- Assume implementation of new NRT system as described
- Planned NRT system with 4 nodes could accommodate the load
  - A single node can geolocate all the nighttime data from 4 DMSPs
  - Two nodes could do the geolocation + mosaic assembly
- Development needed to optimize override rules for best composites
  - Middles of orbits best, discard sunlit and glare
- Standard format would be UTD – spanning longitudes -180^{o} to 180^{o}
  - Mosaic would be regenerated each time new data became available
- Finished UTD mosaics would be archived
- Web access allow unrestricted browse of decimated mosaics
- Access to full resolution mosaics & interactive sub-setting via password protected subscription services

Subscription based access to NRT global mosaics could become major funding source for EOG.

Future Directions
Earth Observation Group

- Focus on service to NESDIS by providing data center functionality for NOAA and other EO data.
- Continue DMSP archive and flagship nighttime lights products. DMSP built out to F-20 (2015 – or possibility 2022 per latest NPOESS schedule alternative)
- Building data center functionality for additional EO data sets:
  - MODIS and VIIRS (they go together)
  - NOAA NOS scanned aerial photography (NOS has submitted a CDMP proposal for scanning the archive)
  - Other NASA EO data covered by 1989 MOU (e.g. HCMM)
- Develop capability to provide nighttime lights data and products from the VIIRS DNB data. Data from the IDPS will have to be reprocessed to fix scanline offsets and apply a terrain correction. EOG plans to work on the algorithms and develop a processing system for NRT users and global lights.
- Propose ***NightSat*** specifically designed for global mapping of nighttime lights.
  - Mission concept submitted to NRC Decadal Survey
  - NightSat manuscript in review at IJRS

Accomplishments
Earth Observation Group

- 2 peer review publications
- Demonstrated potential for 800 GB per day a transfer rate from NGDC to MAFF Japan
- Conducted first global assessment of gas flaring trends
  - Finding that global levels have been stable since the early 1990's and that Russian flaring is vastly underestimated
- Developed a satellite data derived global poverty index
  - Manuscript submitted for publication
- NOAA Proposals submitted to PRIDE, North Gulf Coast Initiative and Education Initiative all turned down

Issues & Concerns
Earth Observation Group

- **An additional $400K in funds are needed to cover projected FY07 expenses.**
- **Project funds are being used to maintain the DMSP archive (e.g. reprocessing into the new tape library)**
- **Subscription based access to online web map server for near real time global mosaics and lunar cycle composites viewed as the best prospects for filling the funding gap.**
- **DMSP archive and nighttime lights support multiple NOAA programs – is Marine Transportation System the best program for the EOG? How about Satellite Data Services?**

OUTLINE
STP Program Management Review

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Concluding Remarks
STP Program Management Review

- FY06 budgets are now balanced – *Thanks, Karen*
- Efforts underway for accession planning
- How EOG fits into the NOAA program structure continues to be a challenge
- CLASS will continue to divert organic resources from the STP mission
- Problems with the ionosonde database are being addressed
- Generic division brief available for general use